

Abstract

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Provided are methods of screening for the occurrence of gene silencing (e.g. post transcriptional gene silencing) in an organism (e.g. a plant or animal), which method comprises the steps of:

- (i) obtaining a sample of material from said organism,
- (ii) producing a nucleic acid extract from said sample,
- (iii) analysing said extract such as to determine the presence or absence of short RNA molecules which are approximately 25 nucleotides in length (SRMs) in said nucleic extract,
- (iv) correlating the presence of said SRMs in the extract with the occurrence of gene silencing in said organism. The SRMs are preferably short anti-sense RNA molecules (SARMS). Also provided are associated methods for detecting the silencing of a target gene in an organism. Processes for isolating one or more RNA molecules, such as SARMS, which may be advantageously employed in the method, may include a purification step selected from (i) filtration; (ii) differential precipitation (iii) ion exchange chromatography, followed by separation the purified RNA molecules according to size by electrophoresis through 15% polyacrylamide gel containing 7M urea as a denaturant and TBE (0.5x) as a buffer, and blotting by electrophoresis. Also provided are processes for isolating silencing agents comprising SRMs; methods of selecting target regions of target genes for directed silencing; and methods of silencing target genes in organisms based on these. Silencing in a first organism may be achieved by generating in a second organism, SRMs which are introduced into the first organism such as to silence a target gene therein. Also provided are DNA constructs, host cells, plants and non-human mammals which comprise target genes which have been silenced in accordance with the methods herein.